**Abstract**

This poster presents our feedback following a first use of Code_Saturne dedicated to the activity propagation calculation in a simplified EPR ventilation shaft. This study was done for EDF to see the particle behavior in case of an accident in the primary cooling system.

### Subject

Geometry and meshing of the ventilation shaft are computed within SALOME while Code_Saturne is used to assess the activity propagation in the EPR ventilation shaft.

The ventilation system is defined as follows:

- entry (inflow): access transfer tube,
- first exit (outflow): low flow,
- second exit (outflow): high flow.

The lagrangian module is then used to simulate the particle behavior inside the ventilation shaft and to extract the volumic concentration at each detection point.

### Results:

As a first approach the calculated volumic concentrations in each detector are not statistically consistent. The observed variation problems are probably due to the differences between the inflow (100 m³/h) and the two outflows (5000 m³/h and 25000 m³/h).

However this work with Code_Saturne has allowed us to understand and conclude that:

- The particles do not move to the low flow shaft when high flow runs.
- The detection time at each detector can be determined.

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- A detailed tutorial allowing the quick comprehension and use of Code_Saturne.
- A support (Saturne_support) very reactive to all our questions.
- A user friendly and simple Graphical User Interface.
- The possibility of post-process the display values with Paraview.
- The ability to treat different mesh formats as input of Code_Saturne.
- A well documented and detailed Fortran code.
- A “user Club” allowing to share experiences in using Code_Saturne.

- Difficulties in installing the code-library.
- Difficulties in taking over the source code.
- The need to modify the Fortran files to carry out specific calculations.
- A code that can be time consuming for some particular calculations.
- A still small user community compared to code_Aster